

REMARKS

In the Office Action, the Examiner objected to the specification under 37 CFR 1.77 because it did not contain the appropriate section headings. The Examiner objected to claims 1-11 for containing grammatical informalities. The Examiner rejected claims 1-7, 9 and 10 under § 103 as being unpatentable over USP 4,890,066 issued to Straver et al. (Straver) in view of USP 6,556,535 issued to Kobayashi (Kobayashi). In addition, the Examiner rejected claims 8 and 11 under § 103 as being unpatentable over Straver in view of Kobayashi, and further in view of USP 4,809,554 issued to Shade et al. (Shade).

In this Amendment, Applicants have amended claims 1-11. No claims have been added or 10 deleted. Accordingly, claims 1-11 will be pending after entry of this Amendment.

I. Specification

In the Office Action, the Examiner objected to the specification because it did not contain the appropriate section headings. Applicants have amended the specification to include the following section headings: Field of the Invention, Background of the Invention, Summary of the 15 Invention, Brief Description of the Drawing, and Detailed Description of the Invention.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the objection to the specification.

II. Informalities in Claims 1-11

Claims 1, 4, 6, and 9 were objected to because they required a transitional phrase 20 “comprising” between the preamble and the body of the claim. Applicants have amended claims 1, 4, 6, and 9 to recite the appropriate transitional phrase.

The Examiner also objected to claims 4 and 9 for failing to provide the appropriate indentations to separate their claim elements. Applicants have amended claims 4 and 9 to include the proper indentation. In addition, Applicants have amended claims 1 and 6 to include such indentation.

5 The Examiner further objected to claim 9 for including the word “of” between “method” and “for” in the claim. Applicants have deleted the word “of” between “method” and “for” in claim 9.

10 The Examiner objected to claims 2-3, 5, 7, 8, 10, and 11 for omitting commas between their claim numbers and “wherein”. Applicants have amended claims 2-3, 5, 7, 8, 10, and 11 to include commas between their claim numbers and “wherein”.

Additionally, claim 4 was amended to remove the unnecessary words “means for” at the beginning of the last limitation of the claim.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the informalities objections to claims 1-11.

15 **III. Claims 1-3**

The Examiner objected claims 1-3 under § 103 as being unpatentable over Straver in view of Kobayashi. The Applicants respectfully traverse this rejection.

Claims 2 and 3 are dependent directly or indirectly on independent claim 1. Claim 1 recites an envelope detector that determines whether the level of a differential input signal DPIN
20 – DNIN is above a reference voltage V_{REF} . The envelope detector comprises means that converts a differential input signal to a differential current IDP - IDN and the reference voltage to a

reference current I_{REF} . The envelope detector also comprises means that compares the currents to determine if $|IDP - IDN|$ is greater than I_{REF} . The envelope detector further comprises means that indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through

5 their piecemeal hindsight combination, disclose, teach, or even suggest such an envelope detector. Specifically, Applicants respectfully submit that the cited art does not disclose, teach, or even suggest an envelope detector that:

- converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} ;
- compares the currents to determine if $|IDP - IDN|$ is greater than I_{REF} ; and
- indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants submit that the cited references fail to disclose, teach, or even suggest three limitations of claim 1: (a) converting a reference voltage to a reference current; (b) comparing a reference current to a differential current; and (c) converting a differential input signal to a differential current.

A. Cited references do not disclose, teach, or even suggest converting a reference voltage to a reference current

The Examiner points to Fig. 2 of Straver as disclosing a differential amplifier for converting a reference voltage ($+V_b$) to a reference current (I_1-I_2). However, the referenced 20 amplifier discloses currents I_1 and I_2 as two separate currents and does not suggest combining them into a single reference current. Moreover, Straver discloses that currents I_1 and I_2 are actually “collector current sources” that are driven by the “power supply voltage” $+V_b$. (Straver:

c3, 30-33). As such, the voltage +Vb is not a reference voltage nor is it converted into a reference current. Therefore, Straver does not disclose, teach, or even suggest an envelope detector that converts a reference voltage to a reference current.

5 B.Cited references do not disclose, teach, or even suggest comparing a reference current to a differential current

The Examiner correctly states that Straver does not disclose comparing means to determine whether a differential input signal is greater than the alleged reference current (I1-I2). However, the Examiner states that it would have been obvious to incorporate a comparator as disclosed in Kobayashi. Applicants respectfully disagree with this reasoning. As discussed above, 10 the currents I1 and I2 in Straver cannot serve as the single reference current of claim 1. Accordingly, in Straver, there is no reference current to compare to a differential input signal. Therefore, the cited art does not disclose, teach, or even suggest an envelope detector that compares a reference current to a differential current.

15 C.Cited references do not disclose, teach, or even suggest converting a differential input signal to a differential current

The Examiner states that the differential amplifier disclosed in Straver converts a differential input signal (Is-Ic) into a pair of current signals (i1-i2). However, the referenced amplifier discloses the currents Is and Ic as two separate single ended signals. Similarly, the currents i1 and i2 are disclosed as two separate single ended signals. Applicants submit that a 20 differential signal is distinct from a single ended signal in that the value of a differential signal is the difference between the individual values of each of its signals. Conversely, The value of a single ended signal is the value of its single signal referenced to ground. As such, currents (Is-Ic) and currents (i1-i2) are not differential signals, rather they are single-ended signals. Therefore,

Straver does not disclose, teach, or even suggest an envelope detector that converts a differential input signal to a differential current.

Accordingly, Applicants respectfully submit that the cited references do not render claim 1 unpatentable. As claims 2 and 3 are dependent on claim 1, Applicants respectfully submit that 5 claims 2 and 3 are patentable over the cited references for at least the same reasons that were discussed above for claim 1. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claims 1-3.

IV. Claims 4 and 5

The Examiner rejected claims 4 and 5 under § 103 as being unpatentable over Straver in 10 view of Kobayashi. The Applicants respectfully traverse this rejection.

Claim 5 is dependent directly on independent claim 4. Claim 4 recites a method that determines whether the level of a differential input signal DPIN - DNN is above a reference voltage V_{REF} . This method converts a differential input signal to a differential current IDP - IDN and the reference voltage to a reference current I_{REF} . The method next compares the currents to 15 determine if $|IDP - IDN|$ is greater than I_{REF} . The method then indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their piecemeal hindsight combination, disclose, teach, or even suggest such a method. Specifically, Applicants respectfully submit that the cited art does not disclose, teach, or even 20 suggest a method that:

- converts the differential input signal to a differential current IDP – IDN;

- converts the reference voltage to a reference current I_{REF} ;
- compares the currents to determine if $|IDP - IDN|$ is greater than I_{REF} ; and
- indicates a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully disagree with the Examiner's characterization of the prior art on three grounds. First, as mentioned above in section III.A., the cited references do not convert a reference voltage to a reference current. Second, as mentioned above in section III.B., the cited references do not compare a reference current to a differential current. Third, as mentioned above in section III.C., the cited references do not convert a differential input signal to a differential current.

Accordingly, Applicants respectfully submit that the cited references do not render claim 4 unpatentable. As claim 5 is dependent on claim 4, Applicants respectfully submit that claim 5 is patentable over the cited references for at least the same reasons that were discussed above for claim 4. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claims 4 and 5.

15 V. Claims 6-8

The Examiner rejected claims 6 and 7 under § 103 as being unpatentable over Straver in view of Kobayashi. Additionally, the Examiner rejected claim 8 under § 103 as being unpatentable over the combination of Straver, Kobayashi, and Shade.

Claims 7 and 8 are dependent directly or indirectly to claim 6. Claim 6 recites an envelope detector that determines whether the level of a differential input signal DPIN - DNIN is above a reference voltage V_{REF} . The differential input signal is cyclical with DPIN and DNIN each being greater than the other during alternate cycles and crossing over during a switching

interval between the cycles. The envelope detector comprises means that converts a differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} . The envelope detector also comprises means that compares the currents and providing an output signal indicative of a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} . The
5 envelope detector further comprises means that maintains the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their piecemeal hindsight combination, disclose, teach, or even suggest such an envelope detector. Specifically, Applicants respectfully submit that the cited art does not disclose, teach, or
10 even suggest an envelope detector that:

- converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} ;
- compares the currents and providing an output signal indicative of a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} ; and
- maintains the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully disagree with the Examiner's characterization of the prior art on three grounds. First, as mentioned above in section III.A., the cited references do not convert a reference voltage to a reference current. Second, as mentioned above in section III.B., the cited
20 references do not compare a reference current to a differential current. Third, as mentioned above in section III.C., the cited references do not convert a differential input signal to a differential current. Applicants respectfully note that the preamble of claim 6 identifies a differential input signal as a signal that is cyclical with DPIN and DNIN each being greater than the other during

alternate cycles and crossing over during a switching interval between the cycles. The cited references do not disclose this characteristic of a differential signal.

Accordingly, Applicants respectfully submit that the cited references do not render claim 6 unpatentable. As claims 7 and 8 are dependent on claim 6, Applicants respectfully submit that 5 claims 7 and 8 are patentable over the cited references for at least the same reasons that were discussed above for claim 6. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claims 6-8.

VI. Claims 9-11

The Examiner rejected claims 9 and 10 under § 103 as being unpatentable over Straver in 10 view of Kobayashi. Additionally, the Examiner rejected claim 11 under § 103 as being unpatentable over the combination of Straver, Kobayashi, and Shade.

Claims 10 and 11 are dependent directly on independent claim 9. Claim 9 recites a method that determines whether the level of a differential input signal DPIN - DNIN is above a reference voltage V_{REF} . The differential input signal is cyclical with DPIN and DNIN each being 15 greater than the other during alternate cycles and crossing over during a switching interval between the cycles. This method converts a differential input signal to a differential current IDP - IDN and the reference voltage to a reference current I_{REF} . The method next compares the differential current and the reference current. The method then provides an output signal indicative of a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} . The method next 20 maintains the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully submit that the cited references, neither separately nor through their piecemeal hindsight combination, disclose, teach, or even suggest such a method. Specifically, Applicants respectfully submit that the cited art does not disclose, teach, or even suggest a method that:

- 5 • converts the differential input signal to a differential current $IDP - IDN$ and the reference voltage to a reference current I_{REF} ;
- 10 • compares the differential current and the reference current;
- provides an output signal indicative of a valid differential signal when $|IDP - IDN|$ is greater than I_{REF} ; and
- maintains the output signal during the switching interval following a cycle in which $|IDP - IDN|$ is greater than I_{REF} .

Applicants respectfully disagree with the Examiner's characterization of the prior art on three grounds. First, as mentioned above in section III.A., the cited references do not convert a reference voltage to a reference current. Second, as mentioned above in section III.B., the cited 15 references do not compare a reference current to a differential current. Third, as mentioned above in section III.C., the cited references do not convert a differential input signal to a differential current. Applicants respectfully note that the preamble of claim 9 identifies a differential input signal as a signal that is cyclical with DPIN and DNIN each being greater than the other during alternate cycles and crossing over during a switching interval between the cycles. The cited 20 references do not disclose this characteristic of a differential signal.

Accordingly, Applicants respectfully submit that the cited references do not render claim 9 unpatentable. As claims 10 and 11 are dependent on claim 9, Applicants respectfully submit that claims 10 and 11 are patentable over the cited references for at least the same reasons that

were discussed above for claim 9. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claims 9-11.

CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-11, are
5 in condition for allowance. Reconsideration of the rejections and objections is requested.
Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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